Department of Energy Awards Ceremony

Office of Science
and
Office of Defense Programs

Early Career Scientist and Engineer Awards

James Forrestal Building
Room 1E-245
1000 Independence Avenue, SW
Washington, D.C. 20585
May 4, 2004

The Secretary of Energy
Washington, DC 20585

In Recognition and Appreciation

The Department of Energy today is proud to salute seven exemplary investigators from the Department's National Laboratories and collaborating universities. Each of these investigators is the recipient of one of the special annual awards the Department's Office of Science and Office of Defense Programs sponsor: the Early Career Scientist and Engineer Awards.

Along with the Office of Science and the National Nuclear Security Administration's Office of Defense Programs, I want to take this opportunity to recognize the extraordinary scientific and technical achievements represented by the awardees' contributions. These Departmental awards reflect our belief that the representatives of the new generation of scientists and engineers honored by these awards are meeting demanding scientific and technical challenges with superior leadership, knowledge and insight.

The awards demonstrate the Department's enduring interest in creative scientific and technical talent. Each honoree has made a distinctive contribution both as an independent investigator and as a team member. Individually and collectively, they continue to be sources of invaluable technical direction and expertise in support of the Department's research and development and national security missions.

It is absolutely crucial to these Departmental missions that we continue to invest in and to nurture the development of the technical leaders of the future. It is equally important that the Department, on occasions such as this, recognizes its critical need for active and sustained partnerships with the Nation's scientific and technical communities.

I am pleased to offer my heartiest congratulations to this group of outstanding investigators on the occasion of their receipt of these Departmental awards.

Spencer Abraham

Spencer Abraham

AWARDEES

Dr. Jeffery C. Blackmon
Oak Ridge National Laboratory

Dr. Edmond Chow
Lawrence Livermore National Laboratory

Dr. Sergei Maslov
Brookhaven National Laboratory

Dr. Jonathan E. Menard
Princeton Plasma Physics Laboratory

Dr. Christine Orme
Lawrence Livermore National Laboratory

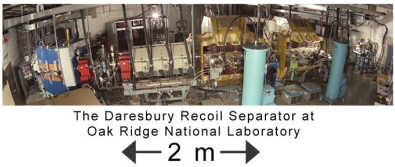
Dr. Carl Boehlert
Alfred University

Dr. Krishnakumar Garikipati
The University of Michigan

Dr. Jeffery C. Blackmon

Oak Ridge National Laboratory

Dr. Jeffery C. Blackmon is a Research Staff Member in the Oak Ridge National Laboratory (ORNL) Physics Division. He has conducted research in the interdisciplinary field of experimental nuclear astrophysics. Dr. Blackmon's research is based at the ORNL Holifield Radioactive Ion Beam Facility (HRIBF), a unique national resource that provides beams of radioactive nuclei for experiments by researchers from around the world. He has been a driving force in the research program using radioactive beams to understand how stars explode. He has led and successfully completed a number of very important experiments—the most risky and challenging of any at HRIBF. He has assembled and commissioned sophisticated experimental devices, including a 90-ton mass separator system, as well as contributing to the difficult development of radioactive beams.



The Daresbury Recoil Separator at Oak Ridge National Laboratory

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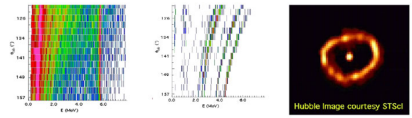


Raw Reaction Yield | with DRS | Nova Cygni 1992

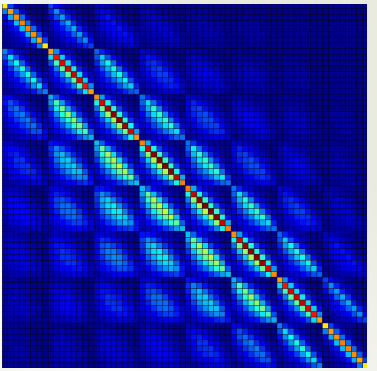
Hubble Image courtesy STScI

For his pioneering work in implementing a program of measurements at the ORNL Holifield Radioactive Ion Beam Facility with radioactive nuclear beams to understand stellar explosions.

Dr. Edmond Chow

Lawrence Livermore National Laboratory

Dr. Edmond Chow is a computational scientist at the Lawrence Livermore National Laboratory in the Center for Applied Scientific Computing. Dr. Chow has made exceptional contributions to the field of computational science. His achievements in the area of scalable numerical algorithms under the ASCI program and the SciDAC initiative have generated robust iterative solvers for general sparse linear systems that are among the most important in the field. He has shown excellent skill in efficiently coding complex techniques. One of his key ideas was to determine the pattern of the approximate inverse from the graph of the powers of the original matrix. This work culminated when Parasails, the code developed by Dr. Chow, permitted the parallel solution of the largest system ever attempted with approximate inverse methods.

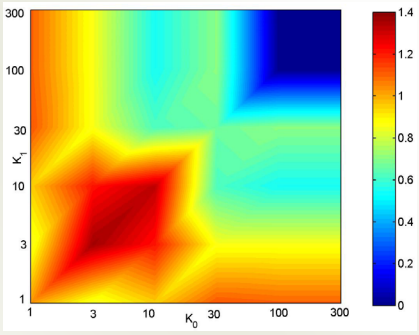


For research into preconditioning methods for discretized partial differential equations that has enabled scientists at LLNL to perform implicit simulations that were previously impossible. His planned research will produce still more sophisticated techniques; these will greatly facilitate the manner in which numerical simulation methods are developed and applied.

Dr. Sergei Maslov

Brookhaven National Laboratory

Dr. Sergei Maslov is a Physicist at the Brookhaven National Laboratory. He started his scientific career at Brookhaven, working in a novel area of theoretical statistical physics which became known as Complexity Studies. Dr. Maslov is one of the pioneers of an emergent field of econophysics, which is applying methods of theoretical statistical physics to problems in economics and finance. In recent years, his research has concentrated on the statistical physics of networks. The spectrum of applications is broad and ranges from cellular biology to the Internet, and economics. His accomplishments in this field include applying the general method of detecting statistically significant patterns in complex networks to protein networks, which can be extended to the field of molecular biochemistry. His research on problems in quantum magnetism is also well recognized, both domestically and internationally.

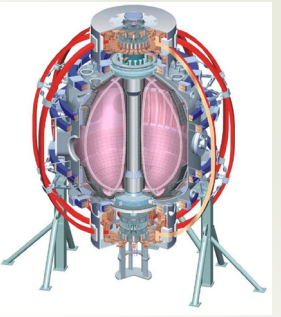


For his contributions to the physics of complex systems.

Dr. Jonathan E. Menard

Princeton Plasma Physics Laboratory

Dr. Jonathan E. Menard is a researcher at the Princeton Plasma Physics Laboratory. His research has produced the first physics picture of the magnetohydrodynamic stability of low aspect ratio plasma profiles required for optimizing both the performance of these plasmas and the generation of non-inductive, or "bootstrap" current. Dr. Menard showed the importance of control of both the current and pressure profiles in attaining maximum performance, and further showed the critical nature of taking numerical convergence issues into account when performing stability calculations at low aspect ratio. He identified a new stable ST high-pressure plasma regime, which formed the heart of the physics basis for the National Spherical Torus Experiment and the ARIES-ST fusion reactor study. Dr. Menard has also performed novel experiments on CDX-U and NSTX investigating high harmonic fast wave coupling, propagation, heating, and current drive in spherical torus plasmas.

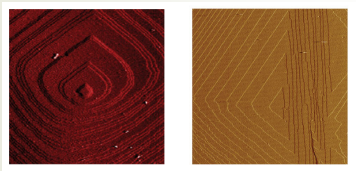


For performing seminal magnetohydrodynamic (MHD) stability optimization studies at low aspect ratio which impact the design and physics basis of the National Spherical Torus Experiment (NSTX) and future spherical torus reactors, and for outstanding experimental contributions to understanding the MHD equilibrium and stability properties of NSTX plasmas.

Dr. Christine Orme

Lawrence Livermore National Laboratory

Dr. Christine Orme is a physicist at the Lawrence Livermore National Laboratory where she leads the Biophysical and Interfacial Science Group. Dr. Orme is an outstanding scientist whose work has risen to a position of prominence in the biomineralization and crystal growth communities. Her research on the mechanisms by which living organisms control materials design and synthesis has catalyzed a new understanding of the stereochemistry of biomineralization. This work has implications for a wide variety of topics ranging from the biomimetic synthesis of nanostructures to the origins of life on Earth. Dr. Orme has established herself as a skilled experimentalist with strong expertise in instrumentation and has taken her background in surface science and crystal growth physics to become the lead scientist for passive film corrosion studies for the Yucca Mountain Project.

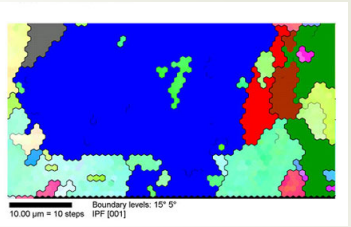


For her work on understanding the physical mechanisms of biomineralization and the development of force microscopy-based methods of investigating mineralization at the nanoscale.

Dr. Carl Boehlert

Alfred University

Dr. Carl Boehlert is an Assistant Professor in Materials Science and Engineering at the New York State College of Ceramics at Alfred University. The award recognizes his contributions to an enhanced understanding of the physical metallurgy of structural intermetallics, actinides, and metal matrix composites. Dr. Boehlert's innovative use of emerging characterization techniques resulted in the pioneering crystallographic orientation mapping of plutonium. His research has contributed to the development of process-structure-property relationships for advanced, complex materials important to the National Nuclear Security Administration's national security mission.



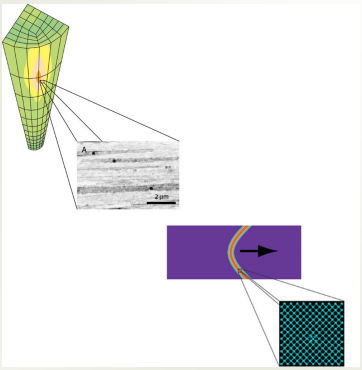
Dr. Boehlert received an NSF CAREER Award in 2002 within the Division of Materials Research for a research program focusing on grain boundary engineering of high-temperature structural alloys including nickel-based superalloys and Ti_2AlNb alloys. He was also a 2002 recipient of a James D. Watson Award from the New York State Office of Science and Technology for Academic Research to establish a methodology for evaluating the microstructure-property relationships of biocompatible titanium alloys. His research areas of interest include materials processing, microstructural evolution, mechanical testing and behavior, microscopy, and microstructure-property relationships of high-temperature alloys and metal matrix composites.

In recognition of his insightful research into structural intermetallics and metal matrix composites, and his innovative use of emerging microstructural characterization techniques for orientation mapping of actinides contributing to an increased understanding of the process-structure-property relationships of these advanced materials.

DR. KRISHNAKUMAR GARIKIPATI

THE UNIVERSITY OF MICHIGAN

Dr. Krishnakumar Garikipati is both Assistant Professor in the Department of Mechanical Engineering and in the Applied Physics Program at the University of Michigan. He was nominated by Sandia National Laboratories, a Department of Energy National Nuclear Security Administration Defense Programs Laboratory, for his significant impact on the development of efficient, robust, numerical solutions of non-local models of solids. The resulting models allow finer resolutions than previously possible.



Dr. Garikipati's research interests involve theoretical and computational approaches to inelasticity and nonlinear continuum mechanics. These include multiphysics problems with special emphasis on phenomena involving mechanics in semiconductor/microelectronic materials and biological tissues as well as multi-scale aspects of material modeling with an emphasis on plasticity at small scales.

For the development of efficient, robust numerical solutions of nonlocal models of solids, which allow the description of their properties at finer resolutions than previously possible.

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